CURRICULUM VITAE

Oleg E. POLOZHENTSEV

Born

Rostov-on-Don (Russia), 25 July 1982

Education and Degrees

2005: Graduated from Applied Mathematics and Mechanics Department of Rostov State University (Russia);
2007 – 2010: Ph. D. student in Physics, Physics Department of Southern Federal University (Russia)
15 October, 2010: **Ph.D.**

Research activity

2007 – **today**: Researcher in Research Center for Nanoscale Structure of Mater, Southern Federal University (Russia);
February – April, 2010: Researcher in HASYLAB, DESY, Hamburg, Germany;
May – June, 2011: Researcher in BESSY II, Berlin, Germany.

Position

1. **Researcher**, Research Center for Nanoscale Structure of Mater, Southern Federal University (Russia);
2. **Lecturer**, Physics Department of Southern Federal University (Russia).

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Fields of interest

- XAS spectroscopy (XANES and EXAFS). Theoretical and experimental investigation of local atomic geometry and electronic structure in various types of condensed matter including:
    - diluted magnetic semiconductors (DMSs);
    - local distortion in multiferroic materials;
    - Mechanism of antitumor drug action;
    - Metal nanoparticles, magnetic fluids.
- effects and properties under the study:

  - 3D local geometry and electronic structure of condensed materials without long range order of atoms

- electronic structure (density of states, hybridization of electronic states and local dynamics of electrons) of condensed materials;

- Coherent X-ray Scattering and Coherent X-ray Diffractive Imaging (CXDI).

Theoretical Methods:

- Advanced theoretical analysis of X-ray Absorption Near Edge Structure (XANES) and DFT analysis;
- Full multiple scattering XANES/EELS simulations (**FEFF**);
- Non-muffin-tin Finite Difference method for XANES/EELS simulations (**FDMNES**).
- Advanced DFT quantum chemistry calculations including geometry optimization (**ADF, BAND**);
- Full-potential band structure calculations (**Wien2k**);
- Molecular Dynamics simulations (**Scigress Explorer**);
- Advanced method for theoretical analysis of X-ray Absorption Near Edge Structure (XANES) to extract 3D(three dimensional) local atomic nanostructure at high resolution on the basis of multi-dimensional interpolation (**FitIt**);

Conference participation

International conferences and meetings

2012: German-Russian Conference on Fundamentals and Applications of Nanoscience, Berlin, Germany;

2012: Young scientists' forum of the closing event of the German-Russian Science Year in the form of a podium discussion with the researchers from German and Russia.

2010: "Coherence-2010" International Conference, Rostock, Germany.

2010, **2008**: XVII International Synchrotron Radiation Conference (Novosibirsk, Russia)

2011, 2009, **2007**: VI National conference XSNE (Moscow, Russia)

2009: 14th International Conference on X-ray Absorption Fine Structure Camerino Italy;

2009: The Second Nanotechnology International Forum, October 6-8, 2009 (Moscow, Russia);

And participation in some regional Russian conferences.

Experimental work

Today: experimental work with laboratory XAS spectrometer “R-XAS Looper” (Rigaku), Southern Federal University, Rostov-on-Don, Russia;

May, June 2011: XAFS and XES in Liquids at BESSYII, Berlin, Germany;

April, 2010: CXDI measurements at Petra III, Hamburg, Germany;

November, 2009: XAFS measurements at RRC “Kurchatov Institute”, Moscow, Russia;

December, 2008: XAFS and XMCD measurements in NSRL, Hefei, China.

Scientific publications

1. Polozhentsev O.E., Mazalova V.L., Kaidashev V.E., Zubavichus Ya., and Soldatov A.V. / *ZnO:Mn nanorods and ZnO/ZnO:Mn core/shell structures: Synthesis and local atomic structure* // J. Phys.: Conf. Series. – 2009. – V. 190 – P. 012138 – 012141.

2. A.A. Guda, N. Smolentsev, J.Verbeek, E.M. Kaidashev, Y. Zubavichus, A.N. Kravtsova, **O.E. Polozhentsev**, A.V. Soldatov / X-ray and electron spectroscopy investigation of the core-shell nanowires of ZnO:Mn // *Solid State Communications* ***151*** (2011) 1314-1317.

3. Soldatov A.V., **Polozhentsev O.E.**, Guda A.A., Smolentsev N.Yu., Kravtsova A.N., Mazalova V.L., Kaidashev E.M., Kaidashev V.E. / *Nanosized ZnO diluted magnetic semiconductors: Synthesis, local atomic and electronic structures* (in Russian) // ISBN 978-5-903257-49-2, – 2010 – pp.150.

4. A.T. Kozakov, **O.E. Polozhentsev**, A.V. Soldatov, K.A. Guglev, I.P. Raevskii, and A.V. Nikol’skii / Electronic Structure of a PbFe1/2Nb1/2O3 Single Crystal in the Magnetoelectric and Paraelectric States, according to X-Ray Photoelectron Spectroscopy and First Principle Calculations // Bulletin of the Russian Academy of Sciences. Physics, 2012, Vol. 76, No. 10, pp. 1143–1145.

5. J. Gulden, O.M. Yefanov, A.P. Mancuso, R. Dronyak, A. Singer, V. Bernátová, A. Burkhard, **O. Polozhentsev**, A. Soldatov, M. Sprung, and I.A. Vartanyants / *Three-dimensional structure of a single colloidal crystal grain studied by coherent x-ray diffraction* // *Optics Express*, Vol. 20 Issue 4, pp.4039-4049 (2012).

6. Adrian P. Mancuso, Matthew R. Groves, **Oleg E. Polozhentsev**, Garth J. Williams, Ian McNulty, Claude Antony, Rachel Santarella-Mellwig, Aleksander V. Soldatov, Victor Lamzin, Andrew G. Peele, Keith A. Nugent, and Ivan A. Vartanyants / *Internal Structure of an intact Convallaria majalis Pollen Grain observed with X-ray Fresnel Coherent Diffractive Imaging* // *Optics Express* (2012) (in press).